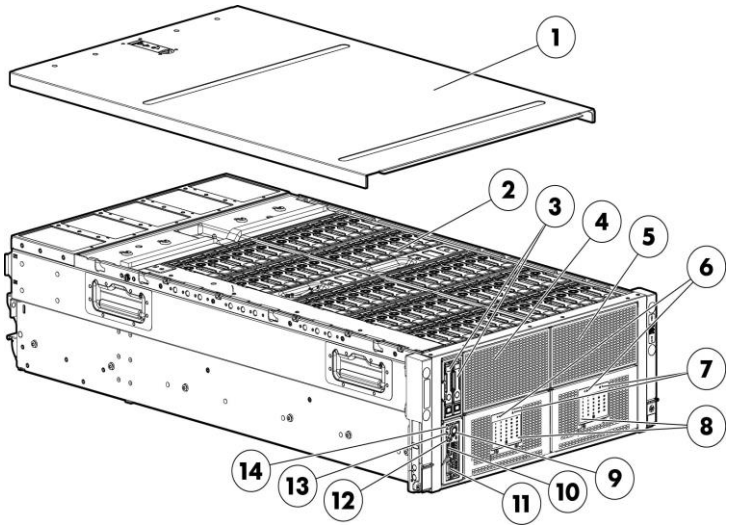
Overview

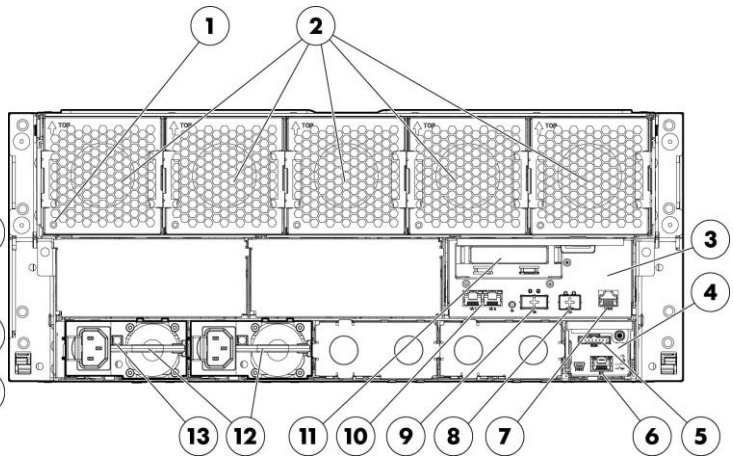
HP ProLiant SL4545 Generation7 (G7) Server

How are you going to scale out to petabytes with your current infrastructure?

Big data, largely unstructured such as messages, images, readings from sensors, and GPS signals from cell phones, are growing at an exponential rate. The HP ProLiant SL4545 G7 Server solves the traditional structured database problems when dealing with big data. Implementing a scale-out infrastructure will invariably result in challenges of data center capacity, spiraling energy costs, infrastructure complexity and inefficiencies because today's siloed infrastructure is not optimized for scale-out server workloads driven by big data. The SL4545 G7 Server is a server purpose-built for big data. A highly efficient converged design that delivers the right combination of capacity and performance, in the least amount of space and at a lower cost.

SL4545 G7 1x60 Model





SL4545 G7 1x60 Model Front View:

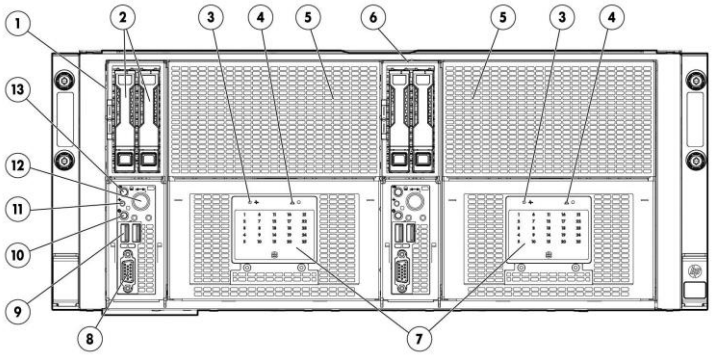
1. Hood Cover
2. LFF 3.5" hard drives (60)
3. SFF 2.5" hard drives on node (2)
4. LFF hard drives (30) connected to storage controller (Port 1i)
5. LFF hard drives (30) connected to storage controller (Port 2i)
6. Hard drive backplane health LED
7. Storage UID
8. Hard drive LED display boards
9. Node ejection button
10. Node USB connectors (2)
11. Node video connector (VGA port)
12. Node power ON/Standby button and system power LED
13. Node health LED
14. Node UID LED button

SL4545 G7 1x60 Model Rear View:

1. Fan LED
2. System fans
3. I/O Module
4. Management Module
5. SL Advanced Power Manager Distribution Module (SL-APMD)connector
6. iLO connector
7. Serial Port
8. 10Gb Ethernet SFP+ port
   NOTE: Available only when 10G I/O module is ordered. 1G I/O Module has 2x1Gb Ethernet ports only.
9. 10Gb Ethernet QSFP port
   NOTE: Available only when 10G I/O module is ordered. 1G I/O Module has 2x1Gb Ethernet ports only.
10. 2 X 1Gb Ethernet ports
11. Low profile PCI express slot
    NOTE: Available only when the optional HP SL454x Storage Mezzanine to PCIe Enablement Kit is ordered
12. Power supplies
13. Power supply LED

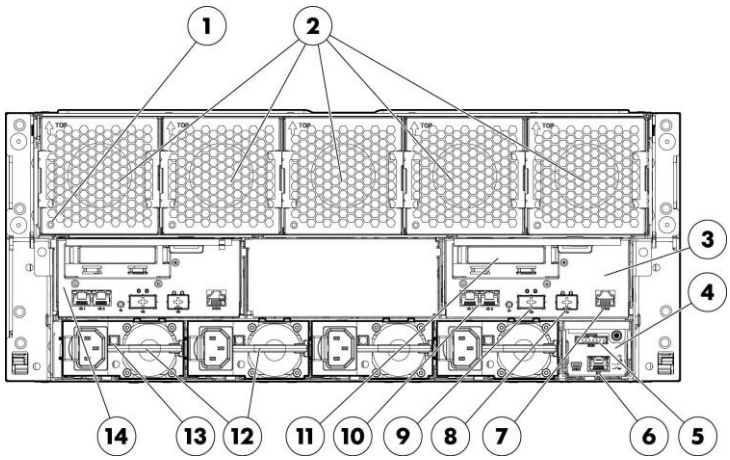
SL4545 G7 2x25 model

Overview



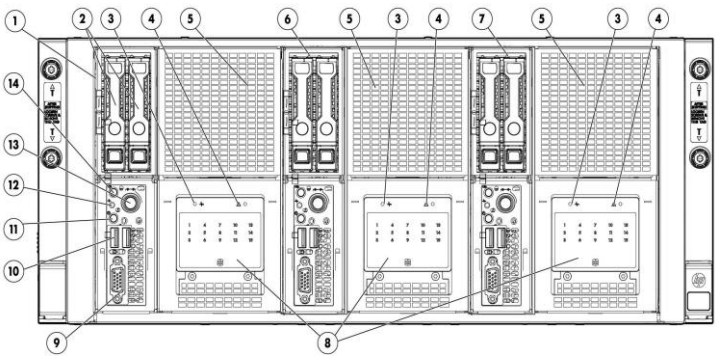
SL4545 G7 2x25 Model Front View:

1. Server Node 1
2. SFF 2.5" hard drives on node (2)
3. Hard drive backplane health LED
4. Storage UID
5. LFF hard drives
6. Server Node 2
7. Hard drive LED display boards
8. Node video connector (VGA port)
9. Node USB connectors (2)
10. Node power ON/Standby button and system power LED
11. Node health LED
12. Node ejection button
13. Node UID LED button



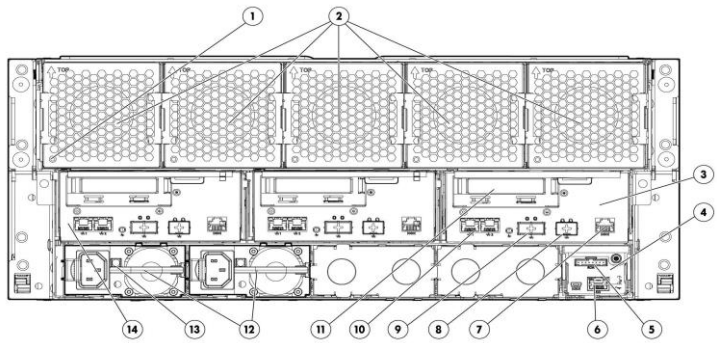
SL4545 G7 2x25 Model Rear View:

1. Fan LED
2. System fans
3. I/O Module Server Node 1
4. Management Module
5. SL Advanced Power Manager Distribution Module (SL-APMD) connector
6. iLO connector
7. Server Serial Port
8. 10Gb Ethernet SFP+ port
   NOTE: Available only when 10G I/O module is ordered. 1G I/O Module has 2x1Gb Ethernet ports only.
9. 10Gb Ethernet QSFP port
   NOTE: Available only when 10G I/O module is ordered. 1G I/O Module has 2x1Gb Ethernet ports only.
10. 2 X 1Gb Ethernet ports
11. Low profile PCI express slot
    NOTE: Available only when the optional HP SL454x Storage Mezzanine to PCIe Enablement Kit is ordered
12. Power supplies
13. Power supply LED
14. I/O Module Server Node 2



SL4545 G7 3x15 Model Front View:

1. Server Node 1
2. SFF 2.5" hard drives on node (2)
3. Hard drive backplane health LED
4. Storage UID



SL4545 G7 3x15 Model Rear View:

1. Fan LED
2. System fans
3. I/O Module Server Node 1
4. Management Module

Overview

5. LFF hard drives connected to Server Node 1 (15)
6. Server Node 2
7. LFF hard drives connected to Server Node 2 (15)
8. Server Node 3
9. LFF hard drives connected to Server Node 3 (15)
10. Hard drive LED display boards
11. Node video connector (VGA port)
12. Node USB connectors (2)
13. Node power ON/Standby button and system power LED
14. Node health LED
15. Node ejection button
16. Node UID LED button

5. SL Advanced Power Manager Distribution Module (SL-APMD) connector
6. iLO connector
7. Serial Port
8. 10Gb Ethernet SFP+ port
   NOTE: Available only when 10G I/O module is ordered. 1G I/O Module has 2x1Gb Ethernet ports only.
9. 10Gb Ethernet QSFP port
   NOTE: Available only when 10G I/O module is ordered. 1G I/O Module has 2x1Gb Ethernet ports only.
10. 2 X 1Gb Ethernet ports
11. Low profile PCI express slot
    NOTE: Available only when the optional HP SL454x Storage Mezzanine to PCIe Enablement Kit is ordered
12. Power supplies
13. Power supply LED
14. I/O Module Server Node 3

What's New

- Updating supported options.

Standard Features

NOTE: For the Standard Features shipped in the Factory Integrated Models, please see the "Configuration Information - Factory Integrated Models" section.

Processor One model of the following per server node	**Eight-Core Processors** AMD Opteron™ 4284 (3.0GHz/8-core/8MB/95W) Processor AMD Opteron™ 4274 HE (2.5GHz/8-core/8MB/65W) Processor **Six-Core Processors** AMD Opteron™ 4238 (3.3GHz/6-core/8MB/95W) Processor AMD Opteron™ 4226 (2.7GHz/6-core/8MB/95W) Processor **NOTE:** DDR3 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed (options for 1600, 1333MHz). **NOTE:** Up to 2 processors supported. Mixing different processor models is not supported.
Cache Memory	8MB (1x8MB) Level 3 Cache **NOTE:** For Eight-core processors. Cache is per socket.
Chipset	AMD® SR5690 Chipset Based Reference Design AMD Opteron™ 4200 Series Processor Family **NOTE:** For more information regarding AMD chipsets, please see the following URL: http://www.amd.com/us/products/Pages/chipsets.aspx
Upgradeability	Upgradeable to two processors
On System Management Processor	HP iLO (Firmware: HP iLO 3) **NOTE:** For more information, visit: http://www.hp.com/go/ilo.
Memory Protection	Advanced ECC (multi-bit error protection)

Memory
Dedicated to each server node

Type	HP SmartMemory DDR3 Registered (RDIMM), Ultra Low Voltage DIMMs (ULVDIMM)
DIMM Slots Available	12 DIMM Slots available
Maximum (RDIMM/ULVDIMM) (per server tray)	192GB (12 x 16GB) Registered memory configurations

NOTE: For additional information, please see the HP SmartMemory QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/14225_div/14225_div.html
NOTE: RDIMMs and ULVDIMMs are all distinct memory technologies and cannot be mixed within a server. The majority of AMD based servers support RDIMM and ULVDIMM.
NOTE: Depending on the memory configuration and processor model, the memory speed may run at 1600MHz or 1333MHz. Please see the Online Memory Configuration Tool at: www.hp.com/go/ddr3memory-configurator.

Network Controller One of the following dedicated to each server node	HP Ethernet 1Gb 2-port 362i HP Ethernet 1Gb 2-port 362i and HP Ethernet 10Gb 2P 544i Adapter **NOTE:** Dual port ConnectX-3 10GbE or QDR IB.

Expansion Slots

Primary Riser Dedicated to	Expansion Slots #	Technology	Bus Width*	Connector Width	Form Factor	Notes

Standard Features

each server node	1	PCIe 2.0	X8	X8	Low profile slot

*Indicates the number of physical electrical lanes running to the connector.
NOTE: One PCIe 2.0 low profile expansion slot is enabled by HP Svr Storage Mezz to PCIe Option Kit 682632-B21 for adding one of the expansion options including an HP IO accelerator, networking options or external storage controller options.
NOTE: Expansion Slot is hosted in the I/O Module.

HP Server ROM

HP ROM (Read Only Memory) is now digitally signed using HP's Corporate Signing Service. This signature is verified before the flash process starts, reducing accidental programming and preventing malicious efforts to corrupt system ROM.

HP ROM provides for essential initialization and validation of hardware components before control is passed to the customer-installed operating system. The ROM also provides the capability of booting from various fixed media (HDD, CD-ROM) and removable media (USB), to continue operation to the operating system.

HP ROM performs very early configuration of the video controller, to allow monitoring of initialization progress via an attached monitor. If configuration or hardware errors are discovered during this early phase of hardware initialization, suitable messages are now displayed on the connected monitor. Additionally, these configuration or hardware errors are logged to the Integrated Management Log (IML) to assist in diagnosis.

HP's ProLiant ROM is used to configure the following:

- Processor and chipset status registers
- System memory, memory map, and memory initialization
- System hardware configuration (Integrated PCI devices and optional PCIe cards).
- Customer-specific BIOS configuration (using the HP ROM-Based Setup Utility (RBSU).

NOTE: For further information, please refer to HP's RBSU (ROM based setup utility) user guide: www.hp.com/support/rbsu.

Storage Controllers
Dedicated to each server node

HP Dynamic Smart Array B110i SATA RAID
NOTE: HP Dynamic Smart Array B110i SATA RAID is located on the server node and controls only the two small form factor (SFF/2.5") hard drives on the server node itself.
NOTE: HP Smart Array P420i is located in the I/O Module, which is located at the rear of the SL4545 chassis and controls the large form factor (LFF/ 3.5") hard drives.

Internal Storage Devices

Diskette Drive	Via USB port, external support only
Optical Drive	Via USB port, external support only
Hard Drives	None ship standard
Drive Bays	2 SFF drive bays total for each server node
	60 LFF drive bays total in chassis for a 1x60 model
	50 LFF drive bays total in chassis for a 2x25 model
	45 LFF drive bays total in chassis for a 3x15 model

Maximum Internal Storage

1x60 Model - 60 LFF Drives per node		
Hot Plug LFF SAS	240.0TB	60 x 4TB
Hot Plug LFF SATA	240.0TB	60 x 4TB
Hot Plug SFF SATA	2.0TB	2 x 1TB
Hot Plug LFF SATA SSD	48.0TB	60 x 800GB

Standard Features

Hot Plug SFF SATA SSD	1.6TB	2 x 800GB

NOTE: The node contains two SFF (2.5") hard drive bays on the front of the server.
NOTE: The main storage section in the chassis has 60 LFF (3.5") hard drive bays and they can be populated with any combination of SAS, SATA, or SATA SSD drives to achieve desired performance.

2x25 Model - 25 LFF Drives per node

Hot Plug LFF SAS	200.0TB	50 x 4TB
Hot Plug LFF SATA	200.0TB	50 x 4TB
Hot Plug SFF SATA	4.0TB	4 x 1TB
Hot Plug LFF SATA SSD	40.0TB	50 x 800GB
Hot Plug SFF SATA SSD	3.2TB	4 x 800GB

NOTE: Each node contains two SFF (2.5") hard drive bays on the front of the node.
NOTE: The main storage section in the chassis has 50 LFF (3.5") hard drive bays, 25 bays per node, and they can be populated with any combination of SAS, SATA, or SATA SSD drives to achieve desired performance.

3x15 Model - 15 LFF Drives per node, 45 LFF Drives per chassis

Hot Plug LFF SAS	180.0TB	45x 4TB
Hot Plug LFF SATA	180.0TB	45 x 4TB
Hot Plug SFF SATA	6.0TB	6 x 1TB
Hot Plug LFF SATA SSD	36.0TB	45 x 800GB
Hot Plug SFF SATA SSD	4.8TB	6 x 800GB

NOTE: Each node contains two SFF (2.5") hard drive bays on the front of the node.
NOTE: The main storage section in the chassis has 45 LFF (3.5") hard drive bays, 15 bays per node, and they can be populated with any combination of SAS, SATA, or SATA SSD drives to achieve desired performance.

Interfaces Dedicated to each server node	Network RJ-45	Two 1GbE NIC ports (available in both 1GbE and 10GbE I/O Module) **NOTE:** Only one of either the 1GbE I/O Module or 10GbE I/O Module can be connected to the node.
	SFP+ connector	One 10GbE SFP+ connector **NOTE:** 10GbE SFP+ and 10GbE/40GbIB QSFP are additional networking interfaces available using optional 10GbE I/O Module.
	QSFP connector	One 10GbE/40GbIB QSFP connector **NOTE:** 10 Gb Ethernet on the QSFP port requires the use of the QSFP to SFP+ adapter 655874-B21 **NOTE:** IB supported with addition of HP IB Enablement Kit
	USB	2 front (external)
	Serial	1 rear (external on I/O Module)
	Video	1 front (external)
	USB Ports	1 (internal)
	HP iLO Remote Management Network Port	10/100 Mb Dedicated (Optionally a 1GbE port can be dedicated to iLO) **NOTE:** Management port is shared
	Health LED	2 front
	Power	1 front
	UID for node	1 front per node and 1 rear on management module
	UID for storage	1 per display board
Industry Standard	ACPI 2.0b Compliant	

Standard Features

Compliance	PCIe 2.0 Compliant WOL Support Microsoft® Logo certifications PXE Support USB 1.1 and 2.0 Compliant SMBIOS 2.6.1
Server Power Cords	One 6' Highline (IEC-IEC) power cord ships standard **NOTE:** HP ProLiant SL servers are primarily connected to PDU's in data center racks so they ship standard with only a PDU power cord (416151-B21). If a user wishes to power a ProLiant SL server using a 110V receptacle (NEMA-15), the NEMA power cord must be ordered separately. **NOTE:** If customers require a local power cord, they can check the power cord matrix for the appropriate cord. Please see the following power cord matrix: http://www.hp.com/go/powercordmatrix.
Power Specifications	To review typical system power ratings use the HP Power Advisor which is available via the online tool located at URL: www.hp.com/go/proliant-energy-efficient or www.hp.com/go/hppoweradvisor. **NOTE:** Power Specification and Technical Content for supported power supplies can be found at: http://h18000.www1.hp.com/products/quickspecs/14209_div/14209_div.html
Common Slot Power Supply	HP's Common Slot (CS) power supplies allow for commonality of power supplies across a wide range of ProLiant and Integrity servers, as well as HP Storage solutions, and are designed to provide the highest power supply efficiency without degrading system performance. HP CS power supplies are tested by the Electric Power Research Institute (EPRI) and certified through the ECOS 80 Plus power supply program. HP CS power supply options provide efficiency ratings of up to 94% and are available in two power output options - 750W, and 1200W - allowing the user to "right-size" a power supply for their specific server configuration. All HP Common Slot power sources are UL, CE Mark Compliant, hot-plug and support redundant configurations. It is highly recommended that you use the HP Power Advisor in defining the "Right-Size" power supply for your needs. HP Power Advisor can be accessed at: www.hp.com/go/hppoweradvisor. **NOTE:** Mixing of power supplies in the same server is not supported. All power supplies must be of the same output and efficiency rating. If non-matched power supplies are inserted you will get errors and operation will fail. **NOTE:** The 80 PLUS program is a unique forum that unites electric utilities, the computer industry, and consumers in an effort to bring energy efficient technology solutions to the marketplace. 80 Plus independently tests power supply efficiency and publicly posts the results on www.80Plus.org. **NOTE:** Redundant Power: Optional redundant power supplies can be purchased through power supply option kits (see Power Supplies for part numbers).
System Fans	System ships standard with 5 Dual fan modules.
Operating Systems and Virtualization Software Support for ProLiant Servers	Microsoft Windows Server Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES) **NOTE:** Only 64-bit versions of these operating systems are supported. **NOTE:** For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server including how to purchase

Standard Features

		from HP, please visit our OS Support Site at: http://www.hp.com/go/ossupport and our driver download page: http://www.hp.com/support/SL4545G7.
Graphics	ATI RN50 integrated with 32MB memory	
Form Factor	4.3U form factor **NOTE:** Can be racked as either a 5U tall chassis or as three chassis in 13U	
On System Management	HP Integrated Lights-Out (iLO) for ProLiant	HP Integrated Lights-Out (iLO) management processors for HP ProLiant servers virtualizes system controls to help simplify server setup, engage health monitoring and power and thermal control, and promote remote administration of HP ProLiant servers. HP iLO functions out-of-the-box without additional software installation and functions regardless of the servers' state of operation. Basic system board management functions, diagnostics, and essential Lights-Out functionality is ship standard. The HP iLO can be accessed from any location via a web browser and works hand-in-hand with HP Systems Insight Manager, Insight Control, and Insight Dynamics, helping customers unleash the value of the ProLiant platform and deliver the highest possible quality of IT service to the business. Advanced functionality, such as graphical remote console, multi-user collaboration, and video record/playback can be activated with the optional HP iLO Advanced or HP iLO Advanced for BladeSystem licenses. The Advanced licensed features offer sophisticated remote administration of servers in dynamic data center and remote locations and can help significantly reduce cost associated with IT-related travel and unplanned downtime. **NOTE:** For more information, visit: http://www.hp.com/go/ilo or how to buy an HP iLO Advanced License visit www.hp.com/buy/ilo Download HP iLO 3 firmware - www.hp.com/support/ilo3
HP Insight Management	HP Service Pack for ProLiant	HP Service Pack for ProLiant (SPP) and HP Smart Update Manager (HP SUM) provide a comprehensive approach to firmware and system software maintenance. Together they provide better operating stability and ensure maximum uptime. The SPP will be updated at a predictable cadence, typically coinciding with new HP server hardware launches. By enabling firmware to be updated online and integrating firmware and system software updates in one operation, HP SUM and the SPP offer faster updates of individual servers and dramatically faster updates of entire BladeSystem enclosures. Further improving system uptime and stability is the fact that HP provides 12 months of support for each Service Pack for ProLiant release. The user experience around HP SUM and the SPP has been improved in several ways, starting with the web download. A single web page provides access to a single download containing both the latest version of HP SUM and the latest SPP. Optional smaller subsets with only specific types of servers or specific operating systems are offered to save on download time. The HP SUM application provides a straightforward, intuitive user interface that guides the user through the steps of discovery, analyses and update, providing comprehensive information on available updates, criticality and interdependencies. This information is also available in

Standard Features

reports. By providing the option of multiple local or shared repositories which can be easily updated from hp.com, HP SUM provides the tools to optimize stability and consistency throughout the company. While HP SUM and the SPP recommend the combinations of firmware and system software that HP has found to be the best practice, the application gives customers the flexibility to set their own specific baseline.

The Service Pack for ProLiant has been rigorously tested with specific attention for interaction between firmware, drivers and agents both within the server as well as in interaction with the BladeSystem enclosure components (Onboard Administrator and Virtual Connect). This testing ensures the highest quality as well as providing the input for HP SUM to deploy updates taking into account all interdependencies, when determining the correct updates and order of update deployment.

NOTE: The Service Pack for ProLiant (which includes HP SUM) can be downloaded from www.hp.com/go/spp/download. More information can be found: http://www.hp.com/go/SmartUpdate, www.hp.com/go/spp and http://www.hp.com/go/hpsum

Security

Power-on password
Keyboard password
QuickLock, Network Server Mode
Serial interface control
Administrator's password
iLO 3 (Integrated Lights-Out 3) has 12 customizable user accounts and SSL encryption
iLO 3 can be disabled via a Global Setting
iLO Advanced supports directory services integration

Warranty

This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for one year from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. Hard drives have either a one year or three year warranty.
NOTE: Server Warranty includes 1 year Parts, 1 year Labor, 1-year on-site support with next business day response. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have HP replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at: http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html.

Optional Features

HP Insight management	HP Insight Control	HP Insight Control, a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, migrate, monitor, remote control, and optimize your IT infrastructure through a single, simple management console. For more information, see http://www.hp.com/go/insightcontrol. HP Insight Control includes one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, see: http://www.hp.com/services/insight.
	HP iLO Advanced	HP Integrated Lights-Out Advanced License a product option, providing smart remote server management without compromise. iLO Advanced unlocks the full set of remote administration functionality for all HP ProLiant servers by activating the full Virtual Keyboard Video and Mouse remote console, multi-user collaboration, console record and replay, GUI-based and scripted virtual media and virtual folders, and enhanced security and power management functionality. For more information, see: http://www.hp.com/go/iloadvance
	HP Matrix Operating Environment	The HP Matrix Operating Environment (Matrix OE) for ProLiant and Integrity servers is an integrated command center that helps you instantly adjust to dynamic business demands. This advanced infrastructure management software lets you reduce the cost of common data center tasks by up to 40 percent while keeping pace with your changing business. The HP Matrix OE includes the automated provisioning, optimization, and recovery management capabilities for HP CloudSystem Matrix, the ideal platform for private cloud and Infrastructure as a Service (IaaS). **NOTE:** For more information, visit: http://www.hp.com/go/matrixoe
High Performance Clusters	HP Cluster Platforms	HP Cluster Platforms are specifically engineered, factory-integrated large-scale ProLiant clusters optimized for High Performance Computing, with a choice of servers, networks and software. Operating system options include specially priced offerings for Red Hat Enterprise Linux and SUSE Linux Enterprise Server, as well as Microsoft Windows HPC Server. A Cluster Platform Configurator simplifies ordering. http://www.hp.com/go/clusters
	HP Insight Cluster Management Utility	HP Insight Cluster Management Utility (CMU) is an HP-licensed and HP-supported suite of tools that are used for lifecycle management of hyperscale clusters of Linux ProLiant systems. CMU includes software for the centralized provisioning, management and monitoring of nodes. CMU makes the administration of clusters user friendly, efficient, and effective. http://www.hp.com/go/cmu
HP Insight Online	HP Insight Online is a new addition to the HP Support Center for one stop, secure access to product and HP support information personalized to your IT environment. Insight Online can automatically display devices remotely monitored by HP Insight Remote Support. With Insight Online's easy navigation you can efficiently track your IT support contracts and device status from anywhere and at anytime. www.hp.com/go/insightonline	
Factory Express Portfolio for Servers and Storage	HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed.	

Optional Features

Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSAxxxx, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches.

For more information on Factory Express services for your specific server model please contact your sales representative or go to: http://www.hp.com/go/factory-express.

HP Simple Configurator

SCE is a guided self service tool to help sales and non technical people provide customers with initial configurations in 3 to 5 minutes. You may then send the configuration on for configuration help, or use in your existing ordering processes. If you require "custom" rack configuration or configuration for products not available in SCE, please contact HP's Customer Business Center or an Authorized Partner for assistance. http://www.hp.com/products/configurator

Service and Support

Service and Support

HP Technology Services for Industry Standard Servers
HP Technology Services delivers confidence, reduces risk and helps customers realize agility and stability. Connect to HP to help prevent problems and solve issues faster. Our support technology lets you to tap into the knowledge of millions of devices and thousands of experts to stay informed and in control, anywhere, any time.
Protect your business beyond warranty with HP Care Pack Services
HP Care Pack Services enable you to order the right service level, length of coverage and response time as you purchase your new server, giving you full entitlement for the term you select.

Optimized Care

Supports maintaining servers at optimum performance availability
HP Proactive Care with 24x7 coverage, three year Care Pack Service
HP Proactive Care helps prevent problems and stabilize IT by utilizing secure, real-time, predictive analytics and proactive consultations when your products are connected to HP. This Care Pack Service combines three years' proactive reporting and advice with our 24x7 coverage and enhanced escalation management, four hour hardware response time and two hour call back for software questions on leading industry standard software running on your HP ProLiant server.
http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA3-8855ENW.pdf

Standard Care

Supports maintaining high level of server availability

Foundation Care 24x7, three-year Care Pack Service
HP Foundation Care 24x7 connects you to HP 24 hours a day, seven days a week for assistance on resolving issues. Hardware onsite response within four hours if needed; collaborative software included in this Care Pack service provides troubleshooting assistance on industry leading software running on your HP server. Simplify your support experience and make HP your first call for hardware or software questions.
http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA4-8876ENW&cc=us&lc=en

Related Services

HP ProLiant Server Hardware Installation
Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner.
http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN.pdf

Factory Express for Servers and storage
HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed. For more information on Factory Express services for your specific server model please contact your sales representative or go to:
http://www.hp.com/go/factory-express.

Data Privacy Services
Protect your data through better media management. HP Data privacy services help manage and protect sensitive data to reduce the risk of unauthorized access to private information and help meet compliance requirements. Our retention services allow you to keep drives and other devices upon failure, our removal services provide convenient data sanitization and our recovery services allow you to safely retire IT assets and capture any remaining value from the hardware.
www.hp.com/services/dataprivacy

Additional HP Care Pack services can be found at: http://www.hp.com/go/cpc

Service and Support

Get connected to HP to improve your support experience

Prevent problems with innovative, automated monitoring tools and proactive services. Combining Proactive Care Services with our remote support technology such as Insight Online provides you with expert advice and personalized, cloud-based automated IT support, helping to prevent unplanned down time and solve problems quickly. For more information, visit: www.hp.com/go/proactiveinsightexperience

Parts and Materials

HP will provide HP-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product quick-specs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by HP due to malfunction.

HP Support Center

Personalized online support portal with access to information, tools and experts to support HP business products. Submit support cases online, chat with HP experts, access support resources or collaborate with peers. Learn more http://www.hp.com/go/hpsc

HP's Support Center Mobile App* allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalize IT support anywhere, anytime. HP Insight Remote Support and HP Support Center are available at no additional cost with a HP warranty, HP Care Pack or HP contractual support agreement.

*HP' Support Center Mobile App is subject to local availability

Warranty / Service Coverage

For ProLiant servers and storage systems, the services cover HP-branded hardware options qualified for the server, purchased at the same time or afterward, internal to the enclosure, as well as external monitors up to 22" and tower UPS products; these items will be covered at the same service level and for the same coverage period as the server unless the maximum supported lifetime and/or the maximum usage limitation has been exceeded. Coverage of the UPS battery is not included; standard warranty terms and conditions apply.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by HP due to malfunction. It does not apply to any exchange of Disk or SSD/Flash Drives that have not failed. SSD/Flash Drives that are specified by HP as consumable parts and/or that have exceeded maximum supported lifetime and/or the maximum usage limit as set forth in the manufacturer's operating manual or the technical data sheet are not eligible for the defective media retention service feature option.

For more information

To learn more on HP ProLiant servers and HP BladeSystem servers, please contact your HP sales representative or HP Authorized Channel Partner. Or visit: http://www.hp.com/services/proliant

Configuration Information - Factory Integrated Models

NOTE: This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for information on configurable product offerings and requirements.
NOTE: Factory Integrated Models must start with a CTO Server.
NOTE: FIO indicates that this option is only available as a factory installable option.
NOTE: All Factory Integrated Models will be populated with sufficient hard drive blanks based on the number of initial hard drives ordered with the server.
NOTE: Rack option is required to be the 1200mm deep rack to provide space for cable management arm and PDU

Step 1: Base Configuration (choose one of the following configurable models)

HP Chassis - 1x60 model	HP ProLiant SL454x 1x Node Chassis **NOTE:** Standard 5 dual fan modules included along with chassis. **NOTE:** Supports 60 LFF drives. One node total.	663600-B21
HP Chassis -2x25 model	HP ProLiant SL454x 2x Node Chassis **NOTE:** Standard 5 dual fan modules included along with chassis. **NOTE:** Supports 50 LFF drives with up to 25 per node. Two nodes total	663600-B22
HP Chassis -3x15 model	HP ProLiant SL454x 3x Node Chassis **NOTE:** Standard 5 dual fan modules included along with chassis. **NOTE:** Supports 45 LFF drives with up to15 per node. Three nodes total	663600-B23
HP Power Supplies	**NOTE:** Prior to making a power supply selection it is highly recommended that the HP Power Advisor is run to determine the right size power supply for your server configuration. The HP Power Advisor is located at: www.hp.com/go/hppoweradvisor	
	HP Common Slot Platinum Plus Power Supply Kits **NOTE:** The following power supplies offer up to 94% efficiency.	
	HP 750W Common Slot Platinum Plus Hot Plug Power Supply Kit	656363-B21
	HP 1200W Common Slot Platinum Plus Hot Plug Power Supply Kit	656364-B21
	HP Common Slot Gold Power Supplies **NOTE:** The following power supplies offer up to 92% efficiency.	
	HP 750W Common Slot Gold Hot Plug Power Supply Kit	512327-B21
	NOTE: Kits contain optional power supply, an IEC power cable and PDU IEC cables.	
HP Rail Kits	**NOTE:** One Rail Kit is required for every chassis in a rack.	
	HP 4.3U Server Rail Kit	681254-B21
	HP 0.66U Spacer Blank Kit **NOTE:** A Spacer Blank kit may be ordered to make an even 5U (4.3U+0.66U) spacing in a rack. This would enable racking of up to 8 chassis in a 42U rack. It is also possible to rack up to 9 chassis in a 42U rack using an additional dense racking option kit. The Spacer Blank kit is not used when the dense racking option HP 13U FIO Rack Adapter Kit for 3x4.3U Chassis is used	681260-B21

Step 2: Choose Required Node Options (only one of the following from each list unless otherwise noted)

HP Processors	**NOTE:** If 2 processor servers are desired, select one xxxxx-L21 and one matching xxxxxx-B21 for every processor option chosen per node
HP Memory	**NOTE:** Please choose memory options for socket 2 of each server node. Up to 6DDR3 DIMM slots dedicated per socket. **NOTE:** For additional information, please see the HP SmartMemory QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/14225_div/14225_div.html **NOTE:** RDIMMs and ULVDIMMs are all distinct memory technologies and cannot be mixed within a server. The majority of AMD based servers support RDIMM and ULVDIMM.

Configuration Information - Factory Integrated Models

	NOTE: Depending on the memory configuration and processor model, the memory speed may run at 1600MHz or 1333MHz. Please see the Online Memory Configuration Tool at: www.hp.com/go/ddr3memory-configurator.	
	Registered DIMMs (RDIMM)	
	HP 4GB (1x4GB) Single Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647871-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647877-B21
	HP 16GB (1x16GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647883-B21
	Ultra Low Voltage DIMM (ULVDIMM)	
	HP 4GB (1x4GB) Single Rank x4 PC3U-10600R (DDR3-1333) Registered CAS-9 Ultra Low Voltage Memory Kit	647869-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3U-10600R (DDR3-1333) Registered CAS-9 Ultra Low Voltage Memory Kit	647875-B21
	HP 16GB (1x16GB) Dual Rank x4 PC3U-10600R (DDR3-1333) Registered CAS-9 Ultra Low Voltage Memory Kit	647881-B21
HP I/O Modules	**NOTE**: One I/O module must be selected per server node. The HP ProLiant SL454x 1G FIO Module Kit supports two (2) embedded 1Gb NICs. The HP SL454x 10G FIO Input Output Module Kit supports two (2) embedded 1Gb NICs and two (2) embedded 10Gb NICs with an optional InfiniBand upgrade. **NOTE:** IB supported with addition of HP IB Enablement Kit **NOTE:** 10 Gb Ethernet on the QSFP port requires the use of the QSFP to SFP+ (QSA) adapter 655874-B21.	
	HP SL454x 1G FIO Input Output Module Kit **NOTE:** IB supported with addition of HP IB Enablement Kit	664647-B21
	HP SL454x 10G FIO Input Output Module Kit	
	HP SL454x 10G Input Output Module Kit	664648-B21
	NOTE: Quantity of I/O module should be 1 for every 1x60 model, 2 for every 2x25 model and 3 for every 3x15 model.	
HP Storage Controllers	**NOTE:** Each node can support up to two of the p420i Gen8 storage controllers to manage the LFF hard drives. **NOTE:** If two p420i Gen8 storage controllers are ordered, the HP SL454x Storage Mezzanine to PCIe Enablement Kit cannot be ordered	
	HP Smart Array P420i Mezzanine Controller FIO Kit **NOTE:** A cache module must be selected. Zero Memory cache option is not supported. The 12 inch Supercap kit must be ordered.	692276-B21
	Optional Upgrades	
	HP 1GB P-series Smart Array Flash Backed Write Cache	631679-B21
	HP 2GB P-series Smart Array Flash Backed Write Cache	631681-B21
	HP 12in Super Capacity Option for Smart Array	668943-B21

Step 3: Choose Additional Factory Integratable Options (only one of the following from each list unless otherwise noted)

PCI Riser	HP SL454x Storage Mezzanine to PCIe Enablement Kit **NOTE:** Needed to enable Low Profile PCIe Slot in the I/O module. Required for ordering any additional PCI Express cards for adding one of the expansion options such as HP IO accelerator, networking options or external storage controller options **NOTE:** If two p420i Gen8 storage controllers are ordered, the HP SL454x Storage Mezzanine to PCIe Enablement Kit cannot be ordered	682632-B21

Configuration Information - Factory Integrated Models

Rack Adapter	HP 13U FIO Rack Adapter Kit for 3X4.3U Chassis **NOTE:** Densely groups three SL4545 chassis into a 13U tall space. Order one per three chassis. The 0.66U spacer is not used when selecting this option.	681677-B21
HP Insight Software	HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Single Server FIO License	C6N36A
	HP Insight Control for BladeSystem including 1yr 24x7 Support Enclosure 16Svr FIO Electronic License	C6N33ABE
	HP Insight Control for BladeSystem including 1yr 24x7 Support Enclosure 8 Svr FIO Electronic License	C6N32ABE
	HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle FIO Electronic License	C6N36ABE

Step 4: Choose Additional Options for Factory Integration

NOTE: For additional options, please refer to the "Core Options" and "Additional Options" section below.

Core Options

NOTE: Some options may not be integrated at the factory. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

HP Processors	**NOTE:** Please choose Processor options for the second processor of each server node.	
	Eight-Core Processors	
	NOTE: All support up to 1600MHz DDR3 memory speeds.	
	HP SL4545 Gen8 AMD Opteron™ 4274HE (2.5GHz/8-core/8MB/65W) Processor Kit	681829-B21
	HP SL4545 Gen8 AMD Opteron™ 4284 (3.0GHz/8-core/8MB/95W) Processor Kit	681826-B21
	Six-Core Processors	
	NOTE: All support up to1600MHz DDR3 memory speeds.	
	HP SL4545 Gen8 AMD Opteron™ 4226 (2.7GHz/6-core/8MB/95W) Processor Kit	681849-B21
	HP SL4545 Gen8 AMD Opteron™ 4238 (3.3GHz/6-core/8MB/95W) Processor Kit	681846-B21
	NOTE: DDR3 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed.	
HP Memory	**NOTE:** Please choose memory options for the second processor of each server node. Up to 6 DDR3 DIMM slots are dedicated per socket. **NOTE:** For additional information, please see the HP Memory QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/14225_div/14225_div.html **NOTE:** RDIMMs and ULVDIMMs are all distinct memory technologies and cannot be mixed within a server. The majority of AMD based servers support RDIMM and ULVDIMM. **NOTE:** Depending on the memory configuration and processor model, the memory speed may run at 1600MHz or 1333MHz. Please see the Online Memory Configuration Tool at: www.hp.com/go/ddr3memory-configurator.	
	Registered DIMMs (RDIMM)	
	HP 4GB (1x4GB) Single Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647871-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647877-B21
	HP 16GB (1x16GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647883-B21
	Ultra Low Voltage DIMM (ULVDIMM)	
	HP 4GB (1x4GB) Single Rank x4 PC3U-10600R (DDR3-1333) Registered CAS-9 Ultra Low Voltage Memory Kit	647869-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3U-10600R (DDR3-1333) Registered CAS-9 Ultra Low Voltage Memory Kit	647875-B21
	HP 16GB (1x16GB) Dual Rank x4 PC3U-10600R (DDR3-1333) Registered CAS-9 Ultra Low Voltage Memory Kit	647881-B21
HP Hard Drives	**NOTE:** For the 1x60 model, choose up to a total of 60 LFF 3.5" hard drives from the following options using any mix of SAS/SATA/SSD hard drives for desired performance and up to a total of 2 SFF 2.5" hard drives from the following options for OS, boot or additional storage purposes. **NOTE:** For the 2x25 model, choose up to a total of 25 LFF 3.5" hard drives per server node from the following options using any mix of SAS/SATA/SSD hard drives for desired performance and up to a total of 2 SFF 2.5" hard drives per server node from the following options for OS, boot or additional storage purposes. **NOTE:** For the 3x15 model, choose up to a total of 15 LFF 3.5" hard drives per server node from the following options using any mix of SAS/SATA/SSD hard drives for	

desired performance and up to a total of 2 SFF 2.5" hard drives per server node from the following options for OS, boot or additional storage purposes.
NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.
NOTE: Hard drives have either a one year or three year warranty.

6G SAS Hot Plug SmartDrive LFF (3.5-inch) Enterprise Drives	
HP 450GB 6G SAS 15K rpm LFF (3.5-inch) SC Enterprise 3yr Warranty Hard Drive	652615-B21
HP 600GB 6G SAS 15K rpm LFF (3.5-inch) SC Enterprise 3yr Warranty Hard Drive	652620-B21
6G SAS Hot Plug SmartDrive LFF (3.5-inch) Midline Drives	
HP 4TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	695510-B21
HP 3TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	652766-B21
HP 2TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	652757-B21
HP 1TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	652753-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.html (Worldwide)

6G SATA Hot Plug with SmartDrive SFF (2.5-inch) Midline (MDL) Drives	
HP 1TB 6G SATA 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	655710-B21
HP 500GB 6G SATA 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	655708-B21
6G SATA Hot Plug with SmartDrive LFF (3.5-inch) Midline (MDL) Drives	
HP 4TB 6G SATA 7.2k rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	693687-B21
HP 3TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	628061-B21
HP 2TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	658079-B21
HP 1TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	657750-B21
HP 500GB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	658071-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13021_div/13021_div.html (Worldwide)

6G SATA Value Endurance Hot Plug LFF (3.5-inch) Enterprise Value Solid State Drives	
HP 800GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive	718189-B21
HP 600GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive	739900-B21
HP 480GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive	718183-B21
HP 300GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive	739890-B21
HP 240GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive	718177-B21
6G SATA ME Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives	
HP 800GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691868-B21
HP 400GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr	691866-B21

Core Options

	Wty Solid State Drive	
	HP 200GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691864-B21
	HP 100GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691862-B21
	6G SATA ME Hot Plug LFF (3.5-inch) Enterprise Mainstream Solid State Drives	
	HP 800GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691860-B21
	HP 400GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691856-B21
	HP 200GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691854-B21
	HP 100GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691852-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/14038_div/14038_div.html (Worldwide)	
HP Networking	**Gigabit Ethernet Adapters**	
	HP NC365T 4-port Ethernet Server Adapter	593722-B21
	10 Gigabit Ethernet adapters	
	HP Ethernet 10Gb 2-port 530SFP Adapter	652503-B21
	HP Ethernet 10Gb 2-port 530T Adapter	656596-B21
	HP Ethernet 10Gb 2-port 561T Adapter	716591-B21
	NOTE: Need to order HP SL454x Storage Mezzanine to PCIe Enablement Kit to enable the low profile PCIe slot. **NOTE:** These are additional expansion options and only one may be selected per server node. **NOTE:** Please see the QuickSpecs for Technical Specifications and additional information: www.hp.com/go/ProLiantNICs	
HP InfiniBand	HP InfiniBand Enablement Kit	614841-B21
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/13078_div/13078_div.html	
HP Power Supplies	**NOTE:** Prior to making a power supply selection it is highly recommended that the HP Power Advisor is run to determine the right size power supply for your server configuration. The HP Power Advisor is located at: www.hp.com/go/hppoweradvisor.	
	HP Common Slot Platinum Plus Power Supply Kits **NOTE:** The following Power Supplies offer 94% efficiency with support for Intelligent Power Discovery	
	HP 750W Common Slot Platinum Plus Hot Plug Power Supply Kit	656363-B21
	HP 1200W Common Slot Platinum Plus Hot Plug Power Supply Kit	656364-B21
	HP Common Slot Gold Power Supplies	
	NOTE: The following power supplies offer up to 92% efficiency.	
	HP 750W Common Slot Gold Hot Plug Power Supply Kit	512327-B21
	NOTE: Kits contain optional power supply, an IEC power cable and PDU IEC cables.	

Additional Options

NOTE: Some options may not be integrated at the factory. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

HP SL Advanced Power Manager	The SL Advanced Power Manager is an optional rack level solution for the HP ProLiant SL4540 and SL4545 which enables server-level DC (or hardware) power on and off and server-level monitoring. In addition, the SL APM will automatically discover SL hardware components which are connected into the SL APM solution. The SL APM does not replace rack PDUs, but is designed to enable the utilization of basic, low cost, rack PDUs while providing the functionality of 'switched' PDUs which provide hardware power on/off of individual servers by turning off the AC power to the power supplies of a given server. Because the SL servers share power supplies to optimize power efficiency, using 'switched' PDUs to turn off the power supplies in the chassis will result in the loss of all servers in that chassis. The SL APM solves this by allowing server-level hardware power on/off of the DC power to the individual server motherboards.	
	HP SL Advanced Power Manager Kit	538084-B21
	HP SL Advanced Power Manager Distribution Module Kit	620002-B21
HP Insight Software	**HP Insight Control**	
	HP Insight Control including 1yr 24x7 Technical Support and Updates Electronic License **NOTE:** The Electronic software license is available in EMEA only.	C6N28ABE
	HP Insight Control including 1yr 24x7 Technical Support and Updates Single Server License	C6N27A
	HP Insight Control Server Provisioning Media Kit	BD883A
	HP Insight Management Media Kit	C6N31A
	NOTE: Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single activation key. **NOTE:** Customer will receive a license entitlement certificate. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service. **NOTE:** Licenses ship without media. The HP Insight Control Media Kit can be ordered separately, or can be downloaded at: http://www.hp.com/go/insightupdates. **NOTE:** For additional license options please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12631_div/12631_div.html	
	HP Integrated Lights-Out (iLO) Advanced for ProLiant	
	HP iLO Advanced including 1yr 24x7 Technical Support and Updates E-LTU **NOTE:** The Electronic software license is available in EMEA only.	E6U59ABE
	HP iLO Advanced including 3yr 24x7 Technical Support and Updates E-LTU **NOTE:** The Electronic software license is available in EMEA only.	E6U64ABE
	HP iLO Advanced including 1yr 24x7 Technical Support and Updates Single Server License	512485-B21
	HP iLO Advanced for BladeSystem including 1yr 24x7 Support Eight Server License	512489-B21
	HP iLO Advanced 1 Server License with 3yr 24x7 Tech Support and Updates	BD505A
	NOTE: For additional license kits, including electronic delivery options, please see the iLO QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/14276_div/14276_div.html **NOTE:** For more information, visit: http://www.hp.com/go/ilo.	

Additional Options

High Performance Clusters	**HP Cluster Management Utility**	
	HP Insight Cluster Management Utility 1yr 24x7 Flexible License	QL803B
	HP Insight Cluster Management Utility 3yr 24x7 Flexible License	BD476A
	NOTE: These part numbers can be used to purchase one certificate for multiple licenses and support with a single activation key. Each license is for one node (server). Customer will receive a printed end user license agreement and license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key. Customer also will receive a support agreement.	
	HP Insight Cluster Management Utility Media	BD477A
	NOTE: For additional license kits please see the QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/12612_div/12612_div.html	
HP I/O Accelerator Options	**Second Generation Accelerators**	
	HP 365GB Multi Level Cell G2 PCIe ioDrive2 for ProLiant Servers	673642-B21
	HP 785GB Multi Level Cell G2 PCIe ioDrive2 for ProLiant Servers	673644-B21
	NOTE: Need to order HP SL454x Storage Mezzanine to PCIe Enablement Kit to enable the low profile PCIe slot. **NOTE:** These are additional expansion options and only one may be selected per server node. **NOTE:** Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13587_div/13587_div.html (Worldwide)	
HP PCIe Workload Accelerator Options	**Mainstream Endurance (ME) PCIe Workload Accelerators**	
	HP 1.4TB HH/HL Mainstream Endurance (ME) PCIe Workload Accelerator	729307-B21
	HP 700GB HH/HL Mainstream Endurance (ME) PCIe Workload Accelerator	729305-B21
	High Endurance (HE) PCIe Workload Accelerators	
	HP 700GB HH/HL High Endurance (HE) PCIe Workload Accelerator	708090-B21
	HP 350GB HH/HL High Endurance (HE) PCIe Workload Accelerator	708088-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/14528_div/14528_div.html (Worldwide)	
HP Security	HP Trusted Platform Module Option	488069-B21
	NOTE: The TPM (Trusted Platform Module) is a microcontroller chip that can securely store artifacts used to authenticate the server platform. These artifacts can include passwords, certificates and encryption keys. Windows® BitLocker™ Drive Encryption (BitLocker) is a data protection feature available in Windows Server® 2008. BitLocker leverages the enhanced security capabilities of a Trusted Platform Module (TPM) version 1.2. The TPM works with BitLocker to help protect user data and to ensure that a server running Windows Server 2008 has not been tampered with while the system was offline. For more information about TPM, including a white paper, go to: www.hp.com/go/TPM. **NOTE:** ProLiant OS pre-installed units will come with the partition required for TPM deployment. **NOTE:** The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss.	

Additional Options

HP Storage Controllers	**SAS Controllers**	
	Smart Array P421 Controller	
	HP Smart Array P421/1GB FBWC 6Gb 2-ports Ext SAS Controller	631673-B21
	HP Smart Array P421/2GB FBWC 6Gb 2-ports Ext SAS Controller	631674-B21
	Optional Upgrades	
	HP 12in Super Capacity Option for Smart Array	668943-B21
	HP 1GB P-series Smart Array Flash Backed Write Cache	631679-B21
	HP 2GB P-series Smart Array Flash Backed Write Cache	631681-B21
	NOTE: Due to cabling requirements, the HP 12in Super Cap is a required option to implement a HP Smart Array Controller with Flash. **NOTE:** Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/14229_div/14229_div.html (Smart Array P421 Controller)	
	Host Bus Adapter	
	HP H221 Host Bus Adapter	650931-B21
	NOTE: Need to order HP SL454x Storage Mezzanine to PCIe Enablement Kit to enable the low profile PCIe slot. **NOTE:** These are additional expansion options and only one may be selected per server node. **NOTE:** Please see the QuickSpecs for Technical Specifications and additional information: http://h18004.www1.hp.com/products/quickspecs/14337_div/14337_div.html (HBA 222)	

HP Power Cords	**NOTE:** HP ProLiant servers ships with an IEC-IEC power cord used for rack mounting with Power Distribution Units (PDUs).	
	HP C13 - C14 WW 250V 10A Gray 0.7m Jumper Cord	A0K03A
	HP C13 - C14 WW 250V 10A Gray 1.37m Jumper Cord	A0K04A
	HP C13 - SEV 1011 CH 250V 10Amp 1.83m Power Cord	AF565A
	HP C13 - DK-2.5A DK 250V 10Amp 1.83m Power Cord	AF566A
	HP C13 - CEE-VII EU 250V 10Amp 1.83m Power Cord	AF568A
	HP C13 - SI-32 IL 250V 10Amp 1.83m Power Cord	AF564A
	HP C13 - NBR-14136 BR 250V 10Amp 1.83m Power Cord	AF591A
	HP C13 - BS-1363A UK/HK/SG 250V 10Amp 1.83m Power Cord	AF570A
	HP C13 - CEI-23-50 IT/CL 250V 10Amp 1.83m Power Cord	AF571A
	HP C13 - C14 WW 250V 10Amp 2.0m Jumper Cord	A0K02A
	HP C13 - IS-1293 IN 250V 10Amp HV 2.5m Power Cord	SG579A
	HP C13 - AS3112-3 AU 250V 10Amp 2.5m Power Cord	AF569A
	HP C13 - SABS-164 ZA 250V 10Amp 2.5m Power Cord	AF567A
	HP C13 - JIS C8303 JP 100V 12Amp 2.0m Power Cord	AF572A
	HP C13 - C14 WW 250V 10A Gray 3.0m Jumper Cord	A0K06A
	HP C13 - Nema 6-15P US 250V 15A JP 3.6m Power Cord	A0N33A
	HP C13 - GB-1002 CN 250V 10Amp 1.83m Power Cord	AF557A
	HP C13 - KSC- 8305 KR 250V 10Amp 1.83m Power Cord	AF560A
	HP C13 - CNS-690 TW 110V 13Amp 1.83m Power Cord	AF561A
	HP C13 - Nema 5-15P TH/PH 250V 10Amp 1.83m Power Cord	AF559A

Additional Options

	HP C13 - Nema 5-15P US/CA 110V 10Amp 1.83m Power Cord	AF556A
	HP C13 - IS-1293 IN 240V 6Amp LV 2.0m Power Cord	AF562A
	HP C13 - IRAM -2073 AR 250V 10A 2.5m Power Cord	AF558A
	HP C13 - C14 WW 250V 10Amp Flint Gray 2.0m Jumper Cord	AF573A
HP Tape Backup	**NOTE:** For the complete range of tape drives, autoloaders, libraries and media see: http://www.hp.com/go/tape. For hardware and software compatibility of HP tape backup products see: http://www.hp.com/storage/SPOCK	
	HP StoreEver LTO-6 Ultrium 6250 Tape Drive in 1U Rack-mount Kit	C0L99A
	HP StoreEver 1/8 G2 LTO-6 Ultrium 6250 SAS Tape Autoloader	C0H18A
HP Tape Storage Systems	**HP StoreEver MSL6480**	
	HP StoreEver MSL6480 Scalable Base Module	QU625A
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/14604_div/14604_div.html (Worldwide)	
HP Disk Storage Systems	**Disk Enclosures**	
	HP D2600 w/12 4TB 6G SAS 7.2K LFF Dual Port MDL HDD 48TB Bundle	E7W32A
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13404_div/13404_div.html (Worldwide)	
HP Uninterruptible Power Systems	**HP Rack-mountable UPS**	
	HP R1500 G3 Uninterruptible Power Supply (UPS)	
	HP R1.5kVA G3 1U NA Uninterruptible Power System	AF469A
	HP R1.5kVA G3 1U JP/TW Uninterruptible Power System	AF470A
	HP R1.5kVA G3 1U INTL Uninterruptible Power System	AF471A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/14059_div/14059_div.html (Worldwide)	
	HP R/T3000 G2 Uninterruptible Power System (UPS)	
	HP R/T3000 G2 2U L530 Low Voltage NA/JP Uninterruptible Power System	AF466A
	HP R/T3000 G2 2U L620 High Voltage NA/JP Uninterruptible Power System	AF467A
	HP R/T3000 G2 2U Detachable Cord High Voltage INTL Uninterruptible Power System	AF468A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/14058_div/14058_div.html (Worldwide)	
	R5000 Uninterruptible Power System (UPS)	
	HP R5KVA 3U IEC309-32A High Voltage INTL Uninterruptible Power System	AF461A
	HP R5KVA 3U L630 High Voltage NA/JP Uninterruptible Power System	AF460A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/14109_div/14109_div.html (Worldwide)	
	R7000 Uninterruptible Power System (UPS)	
	HP R7KVA 4U 50A High Voltage NA/JP Uninterruptible Power System	AF462A

Additional Options

	HP R7KVA 4U IEC-32A High Voltage INTL Uninterruptible Power System	AF463A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/14110_div/14110_div.html (Worldwide)	
	NOTE: For additional information on HP Uninterruptible Power Systems please go to: www.hp.com/servers/rackups.	
	NOTE: For additional information on sizing your server, please reference: http://www.upssizer.com.	
	NOTE: Please see the UPS and PDU cable matrix's on the HP Power Protection and Management page. Under Power Cords, click on the "HP Power Cord Matrix" link. That link will list cable descriptions, requirements, and specifications for UPS and PDU units. Please see the following link: www.hp.com/products/powercords.	
HP Basic Power Distribution Units (bPDU)	**HP Basic Power Distribution Unit: 1U/0U Version**	
	HP 1.9kVA 120 Volt L5-20 Input (12xNEMA 5-20R) NA/JP Basic PDU	H5M54A
	HP 3.6kVA 200-240 Volt Detachable C20 Input (12xC13) WW Basic PDU	H5M56A
	HP Basic Power Distribution Unit: Half Height Version	
	HP 2.8kVA 120 Volt L5-30 Input (18xNEMA 5-20R) NA/JP Basic PDU	H5M55A
	HP 3.6kVA 200-240 Volt Detachable C20 Input (18xC13) WW Basic PDU	H5M57A
	HP 4.9kVA 208 Volt L6-30 Input (20xC13) NA/JP Basic PDU	H5M58A
	HP 7.3kVA 230 Volt IEC309 32A Input (20xC13) INTL Basic PDU	H5M68A
	HP 8.6kVA 208 Volt L15-30 3-Phase Input (18xC13) NA/JP Basic PDU	H5M61A
	HP Basic Power Distribution Unit: Mid Height Version	
	HP 4.9kVA 208 Volt L6-30 Input (24xC13/6xC19) NA/JP Basic PDU	H5M59A
	HP 7.3kVA 230 Volt IEC309 32A Input (24xC13/6xC19) INTL Basic PDU	H5M70A
	HP 8.3kVA 208 Volt CS8265C Input (30xC13/6xC19) NA/JP Basic PDU	H5M60A
	HP 11kVA 230 Volt IEC309 63A Input (30xC13/6xC19) INTL Basic PDU	H5M71A
	HP Hardwired 200-240 Volt Input (30xC13/6xC19) WW Basic PDU	H5M75A
	HP 5.7kVA 208 Volt L21-20 3-Phase Input (24xC13/3xNEMA 5-20R) NA/JP Basic PDU	H5M63A
	HP 8.6kVA 208 Volt L21-30 3-Phase Input (24xC13/3xC19/3xNEMA 5-20R) NA/JP Basic PDU	H5M64A
	HP 8.6kVA 208 Volt L15-30 3-Phase Input (24xC13/6xC19) NA/JP Basic PDU	H5M62A
	HP 11kVA 400 Volt IEC309 16A 3-Phase Input (30xC13/6xC19) INTL Basic PDU	H5M72A
	HP Basic Power Distribution Unit: Full Height Version	
	HP 11kVA 400 Volt IEC309 16A 3-Phase Input (36xC13/6xC19) INTL Basic PDU	H5M73A
	HP 11kVA 400 Volt IEC309 30A 3-Phase Input (36xC13/6xC19) NA Basic PDU	H5M67A
	HP Basic Power Distribution Unit: 480/277 Volt Version	
	HP 13.2kVA 480 Volt IEC309 30A 3-Phase Input (15 Outlet) NA Basic PDU	H3X07A
	HP 19.9kVA 480 Volt IEC309 30A 3-Phase Input (30 Outlet) NA Basic PDU	H3X08A
	HP 800VA - 277V Input / 230V Output NA Rack Mount Transformer	H3X09A
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/14557_div/14557_div.html (Worldwide)	
	NOTE: Additional HP Power Distribution Units are available. For a complete list of all HP PDUs and additional information please visit: www.hp.com/go/rackandpower	
HP Remote Monitoring	**HP Remote Monitored Power Distribution Unit: 1U Version**	

Additional Options

Power Distribution Units (mPDU)	HP 2.8kVA 120 Volt L5-30 Input (12xNEMA 5-20R)NA/JP Monitored PDU	D9N43A
	HP 3.6kVA 200-240 Volt Detachable C20 Input (12xC13) WW Monitored PDU	D9N46A
	HP 4.9kVA 208 Volt L6-30 Input (12xC13) NA/JP Monitored PDU	D9N44A
	HP Remote Monitored Power Distribution Unit: Half Height Version	
	HP 3.6kVA 200-240 Volt Detachable C20 Input (16xC13) WW Monitored PDU	D9N45A
	HP Remote Monitored Power Distribution Unit: Mid Height Version	
	HP 4.9kVA 208 Volt L6-30 Input (20xC13/4xC19) NA/JP Monitored PDU	D9N47A
	HP 7.3kVA 230 Volt IEC309 32A Input (20xC13/4xC19) INTL Monitored PDU	D9N48A
	HP 8.6kVA 208 Volt L15-30 3-Phase Input (18xC13/3xC19) NA/JP Monitored PDU	D9N51A
	HP 5.7kVA 208 Volt L21-20 3-Phase Input (18xC13/3xNEMA 5-20R) NA/JP Monitored PDU	D9N52A
	HP 8.6kVA 208 Volt L21-30 3-Phase Input (20xC13/3xC19/3xNEMA 5-20R) NA/JP Monitored PDU	D9N53A
	HP 11kVA 400 Volt IEC309 16A 3-Phase Input (18xC13/3xC19) INTL Monitored PDU	D9N55A
	HP Remote Monitored Power Distribution Unit: Full Height Version	
	HP 8.3kVA 208 Volt CS8265C Input (30xC13/3xC19) NA Monitored PDU	D9N49A
	HP 7.3kVA 230 Volt IEC309 32A Input (32xC13/4xC19) INTL Monitored PDU	D9N50A
	HP 11kVA 400 Volt IEC309 16A 3-Phase Input (30xC13/3xC19) INTL Monitored PDU	D9N57A
	HP 14.4kVA 208 Volt CS8365C 3-Phase Input (12xC13/12xC19)NA Monitored PDU	D9N58A
	HP 16.6kVA 400 Volt IEC309 30A 3-Phase Input (30xC13/3xC19) NA Monitored PDU	D9N61A
	HP 17.3kVA 208 Volt IEC309 60A 3-Phase Input (24xC13/3xC19) NA/JP Monitored PDU	D9N54A
	HP 17.3kVA 208 Volt IEC309 60A 3-Phase Input (12xC13/12xC19) NA/JP Monitored PDU	D9N59A
	HP 22kVA 400 Volt IEC309 32A 3-Phase Input (12xC13/12xC19) INTL Monitored PDU	D9N60A
	HP 22kVA 400 Volt IEC309 32A 3-Phase Input (30xC13/3xC19) INTL Monitored PDU	D9N56A
	HP 16.6kVA 400 Volt IEC309 30A 3-Phase Input (12xC13/12xC19) NA Monitored PDU	D9N62A
	HP 19.9kVA 480 Volt 3-Phase (30 Outlet) NA Monitored PDU	D9N63A
	HP Environmental Sensor for Remote Monitored PDUs	
	HP Environmental Sensor for Remote Monitored PDUs	E2D53A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/14669_div/14669_div.html (Worldwide)	
HP Intelligent Power Distribution Units (iPDU)	**iPDU Core Units**	
	HP 4.9kVA 24A Single Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF520A
	HP 8.3kVA 40A Single Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF521A
	HP 8.6kVA 24A Three Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF522A
	HP 14.4kVA 40A Three Phase NA/JP Intelligent Modular Power Distribution Unit	AF533A
	HP 17.3kVA 48A Three Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF523A
	HP 17.3kVA 24A 415V Three Phase L22-30 NA Core Intelligent Power Distribution Unit	AF902A
	HP 7.3kVA 32A Single Phase INTL Core Intelligent Modular Power Distribution Unit	AF525A
	HP 11kVA 16A Three Phase INTL Core Intelligent Modular Power Distribution Unit	AF526A
	HP 22kVA 32A Three Phase INTL Core Intelligent Modular Power Distribution Unit	AF527A
	HP 17.3kVA 48A 208V Three Phase 12 Outlet Core NA/JP Intelligent Power	AF535A

Additional Options

	Distribution Unit	
	HP 17.3kVA 24A 415V Three Phase 12 Outlet Core NA/JP Intelligent Power Distribution Unit	AF537A
	HP 22kVA 32A 400V Three Phase 12 Outlet Core INTL Intelligent Power Distribution Unit	AF538A
	iPDU Kits with Standard Extension Bars	
	HP 4.9kVA 24A Single Phase NA/JP Intelligent Modular Power Distribution Kit	AF531A
	HP 8.6kVA 24A Three Phase NA/JP Intelligent Modular Power Distribution Kit	AF532A
	HP 7.3kVA 32A Single Phase INTL Intelligent Modular Power Distribution Kit	AF534A
	iPDU Extension Bars	
	HP 5xC13 Intelligent PDU Extension Bar G2 Kit	AF547A
	HP 5xC13 Outlets Power and UID LEDs Pair Standard Extension Bar	AF528A
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13650_div/13650_div.html (Worldwide) **NOTE:** Additional HP Power Distribution Units are available. For a complete list of all HP PDUs and additional information please visit: www.hp.com/go/rackandpower.	
HP Rack Series	**HP Intelligent Rack Series**	
	HP 636 1200mm Pallet Intelligent Series Rack	BW899A
	HP 636 1200mm Shock Intelligent Series Rack	BW900A
	HP 642 1200mm Pallet Intelligent Series Rack	BW907A
	HP 642 1200mm Shock Intelligent Series Rack	BW908A
	HP 647 1200mm Pallet Intelligent Series Rack	BW913A
	HP 647 1200mm Shock Intelligent Series Rack	BW914A
	NOTE: Rack chosen is required to have 1200mm to provide space for cable management arm at the rear of the chassis and host PDU in the rear of the rack. **NOTE:** Please see the QuickSpecs for Technical Specifications such as height, width, depth, weight, and color: http://h18000.www1.hp.com/products/quickspecs/14223_div/14223_div.html (Worldwide) **NOTE:** For additional information regarding Rack Cabinets, please see the following URL: http://www.hp.com/go/rackandpower.	
HP Rack Options	**HP TFT7600 G2 KVM Console and Monitor (TFT7600 G2)**	
	HP TFT7600 G2 KVM Console Rackmount Keyboard US Monitor	AZ870A
	HP TFT7600 G2 KVM Console Rackmount Keyboard UK Monitor	AZ871A
	HP TFT7600 G2 KVM Console Rackmount Keyboard DE Monitor	AZ872A
	HP TFT7600 G2 KVM Console Rackmount Keyboard FR Monitor	AZ873A
	HP TFT7600 G2 KVM Console Rackmount Keyboard IT Monitor	AZ874A
	HP TFT7600 G2 KVM Console Rackmount Keyboard ES Monitor	AZ875A
	HP TFT7600 G2 KVM Console Rackmount Keyboard DK Monitor	AZ876A
	HP TFT7600 G2 KVM Console Rackmount Keyboard NO Monitor	AZ877A
	HP TFT7600 G2 KVM Console Rackmount Keyboard SE/FI Monitor	AZ878A
	HP TFT7600 G2 KVM Console Rackmount Keyboard CH Monitor	AZ879A
	HP TFT7600 G2 KVM Console Rackmount Keyboard PT Monitor	AZ880A
	HP TFT7600 G2 KVM Console Rackmount Keyboard BE Monitor	AZ881A

Additional Options

	HP TFT7600 G2 KVM Console Rackmount Keyboard JP Monitor	AZ882A
	HP TFT7600 G2 KVM Console Rackmount Keyboard RU Monitor	AZ883A
	HP TFT7600 G2 KVM Console Rackmount Keyboard Intl Monitor	AZ884A
	HP TFT7600 G2 KVM Console Rackmount Keyboard US TAA Monitor	AZ885A
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13731_div/13731_div.html (Worldwide)	
	HP Server Console Switches	
	HP Server Console 0x2x8 Port Analog Switch	AF616A
	HP Server Console 0x2x16 Port Analog Switch	AF617A
	HP TAA 0x2x16xKVM Server Console G2 Switch	AF626A
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/11834_div/11834_div.html (Worldwide)	
	HP Server Console Switch G2 with Virtual Media & CAC	
	HP 0x2x16 KVM Server Console Switch G2 with Virtual Media CAC Software	AF618A
	HP 0x2x32 KVM Server Console Switch G2 with Virtual Media CAC Software	AF619A
	HP KVM CAT5 1-pack USB Interface Adapter	336047-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13475_div/13475_div.html (Worldwide)	
	HP IP Console Switch G2 with Virtual Media & CAC	
	HP 1x4 USB/PS2 KVM Console Switch	AF611A
	HP 1x1Ex8 KVM IP Console Switch G2 with Virtual Media CAC Software	AF620A
	HP 2x1Ex16 KVM IP Console Switch G2 with Virtual Media CAC Software	AF621A
	HP 4x1Ex32 KVM IP Console Switch G2 with Virtual Media CAC Software	AF622A
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13474_div/13474_div.html (Worldwide)	
HP Care Pack Services	HP 3 year Next business day SL454x 1 Node Chassis Hardware Support	U7J55E
	HP 3 year Next business day Defective Media Retension SL454x 1 Node Chassis Hardware Support	U7J56E
	HP 3 year Next business day SL454x 1 Node Chassis Proactive Service	U7J57E
	HP 3 year Next business day Defective Media Retension SL454x 1 Node Chassis Proactive Service	U7J58E
	HP 3 year 4 hour 13x5 SL454x 1 Node Chassis Hardware Support	U7J59E
	HP 3 year 4 hour 13x5 with Defective Media Retension SL454x 1 Node Chassis Hardware Support	U7J60E
	HP 3 year 4 hour 24x7 SL454x 1 Node Chassis Hardware Support	U7J63E
	HP 3 year 4 hour 24x7 Defective Media Retension SL454x 1 Node Chassis Hardware Support	U7J64E
	HP 3 year 4 hour 24x7 SL454x 1 Node Chassis Proactive Service	U7J65E
	HP 3 year 4 hour 24x7 Defective Media Retension SL454x 1 Node Chassis Proactive	U7J66E

Additional Options

Service	
HP 3 year 24 hour 24x7 Call to Repair SL454x 1 Node Chassis Hardware Support	U7J69E
HP 3 year 24 hour 24x7 Defective Media Retension SL454x 1 Node Chassis Hardware Support	U7J70E
HP 3 year 6 hour 24x7 Call to Repair SL454x 1 Node Chassis Hardware Support	U7J71E
HP 3 year6 hour 24x7 Defective Media Retension SL454x 1 Node Chassis Hardware Support	U7J72E
HP 3 year 6 hour 24x7 SL454x 1 Node Chassis Call to Repair Proactive Service	U7J73E
HP 3 year 6 hour24x7 Defective Media Retension SL454x1 Node Chassis Call to Repair Proactive Service	U7J74E
HP 3 year Next business day SL454X Gen8 Tray 1x Node Hardware Support	U7K40E
HP 3 year Next business day Defective Media Retension SL454X Gen8 Tray 1x Node Hardware Support	U7K41E
HP 3 year Next business day SL454X Gen8 Tray 1x Node Proactive Service	U7K42E
HP 3 year Next business day Defective Media Retension SL454X Gen8 Tray 1x Node Proactive Service	U7K43E
HP 3 year 4 hour 13x5 SL454X Gen8 Tray 1x Node Hardware Support	U7K44E
HP 3 year 4 hour 13x5 with Defective Media Retension SL454X Gen8 Tray 1x Node Hardware Support	U7K45E
HP 3 year 4 hour 24x7 SL454X Gen8 Tray 1x Node Hardware Support	U7K48E
HP 3 year 4 hour 24x7 Defective Media Retension SL454X Gen8 Tray 1x Node Hardware Support	U7K49E
HP 3 year 4 hour 24x7 SL454X Gen8 Tray 1x Node Proactive Service	U7K50E
HP 3 year 4 hour 24x7 Defective Media Retension SL454X Gen8 Tray 1x Node Proactive Service	U7K51E
HP 3 year 24 hour 24x7 Call to Repair SL454X Gen8 Tray 1x Node Hardware Support	U7K54E
HP 3 year 24 hour 24x7 Defective Media Retension SL454X Gen8 Tray 1x Node Hardware Support	U7K55E
HP 3 year 6 hour 24x7 Call to Repair SL454X Gen8 Tray 1x Node Hardware Support	U7K56E
HP 3 year 6 hour 24x7 Defective Media Retension SL454X Gen8 Tray 1x Node Hardware Support	U7K57E
HP 3 year 6 hour 24x7 SL454X Gen8 Tray 1x Node Call to Repair Proactive Service	U7K58E
HP 3 year 6 hour 24x7 Defective Media Retension SL454X Gen8 Tray 1x Call to Repair Proactive Service	U7K59E

NOTE: For more information, customer/resellers can contact: http://www.hp.com/services/carepack.

Memory

HP ProLiant SL4545 G7 server

NOTE: Memory configurations listed do not apply to "Factory Integrated Models".
NOTE: Chart does not represent all possible memory configurations.

Memory population guidelines

Some DIMM installation guidelines are summarized below:

- For this server with twelve (12) memory slots:
  - There are two (2) channels per processor; four (4) channels per server
  - There are three (3) DIMM slots for each memory channel; twelve (12) total slots
  - Memory channel 2 consists of the three (3) DIMMs that are closest to the processor
  - Memory channel 1 consists of the three (3) DIMMs that are furthest from the processor
- DIMM slots that are white should be populated first
- DIMM slots are numbered sequentially (1 through 6) for each processor. The supported AMP modes use the alpha assignments for population order, and the slot numbers designate the DIMM slot ID for spare replacement.
- Do not mix Ultra Low Voltage DIMMs memory (ULVDIMMs) with Registered memory (RDIMMs)
- If only one processor is installed in a 2CPU system, only half of the DIMM slots are available
- To maximize performance, balance the total memory capacity between all installed processors
- It is not required, but it is recommended to load the channels similarly if possible

DIMM slot/capacity/populated speed table

DIMM Type	Registered DIMMS (RDIMMs)				
DIMM Rank	**Single Rank (1R)**	**Dual Rank (2R)**			**Quad Rank (4R)**
DIMM Capacity	4GB	2GB	8GB	16GB	16GB
DIMM Native Speed (MHz)	1333	1333	1333	1333	1066
Voltage	LV/Std	Std	LV/Std	LV/Std	Std
SLOTS THAT CAN BE POPULATED					
12 slot servers	12	12	12	12	4
MAXIMUM CAPACITY (GB)					
12 slot servers	48	24	96	192	64
POPULATED DIMM SPEED (MHz)					
1 DIMM Per Channel	1333	1333	1333	1333	1066
2 DIMM Per Channel	1333	1333	1333	1333	n/a
3 DIMM Per Channel	1333	1066	1066	800/1066*	n/a

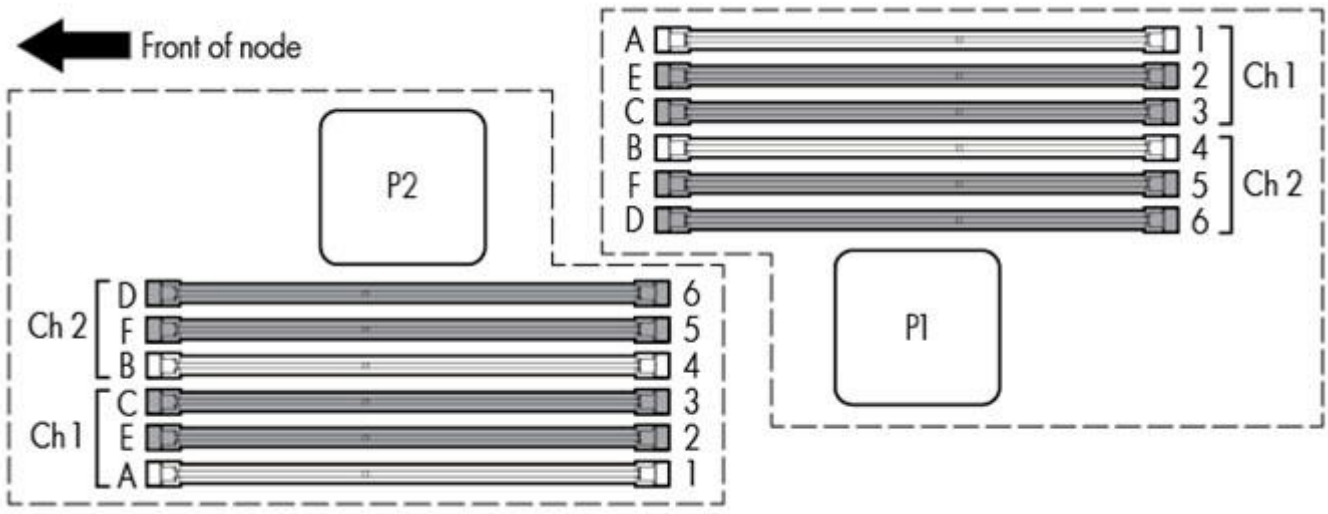
NOTES:

- PC3-10600 DIMMs have a maximum speed of 1333MHz. PC3-8500 DIMMs have a maximum speed of 1066MHz
- Mixing DIMM speeds is allowed, but the system processor speed rules always override the DIMM capabilities
- If you do mix DIMM speeds, the memory bus will default to the minimum clock rate of all DIMMs in the system - even if the slower DIMM is on the other processor
- If you install 1x 1066MHz DIMM in channel 1 and 1x 1333MHz DIMM in channel 2, the maximum speed will be 1066MHz If you install 1x 1066MHz DIMM in channel 1 and 5x 1333MHz DIMMs with 1 DIMM Per Channel (DPC) in each of the other channels, the maximum speed will be 1066MHz
- Maximum memory speed will also depend on the processor installed

Memory

- References to the above MHz speeds are for the various speeds of DDR3 DIMMs; 1333 refers to DDR3-1333, etc.

DIMM slot and configuration diagrams



Basic memory slot & population diagram

- Population order; start with "A" first, "B" second, "C" third, etc.

	12 DIMM SLOTS (6 per CPU)				
	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A	1	A	Chnl 1
	2	E	2	E	
	3	C	3	C	
Chnl 2	4	B	4	B	Chnl 2
	5	F	5	F	
	6	D	6	D	
NOTE: slots 1 and 4 are furthest from the CPU, slots 3 and 6 are closest.					

RDIMM maximum configuration (2 CPU model)

- 192GB, consisting of twelve (12) 16GB Dual-Ranked PC3L-10600 RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A; 16GB DIMM	1	A; 16GB DIMM	Chnl 1
	2	E; 16GB DIMM	2	E; 16GB DIMM	
	3	C; 16GB DIMM	3	C; 16GB DIMM	

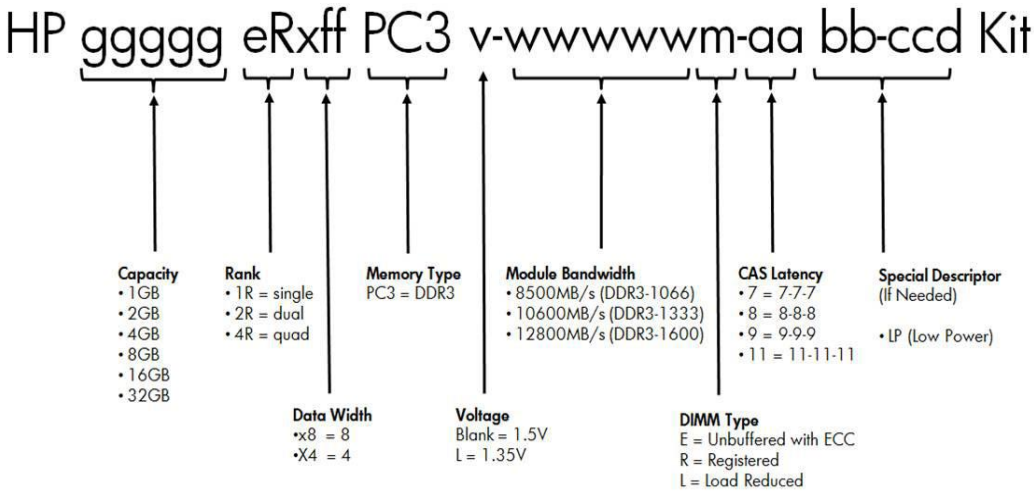
Memory

Chnl 2	4	B; 16GB DIMM	4	B; 16GB DIMM	Chnl 2
	5	F; 16GB DIMM	5	F; 16GB DIMM	
	6	D; 16GB DIMM	6	D; 16GB DIMM	

NOTE: Capacity references are rounded to the common Gigabyte values.

- 1GB = 1024MB
- 2GB = 2048MB
- 4GB = 4096MB
- 8GB = 8192MB
- 16GB = 16384MB

DDR3 memory options part number decoder



Following are memory options available from HP:

HP Memory

NOTE: Please choose memory options for socket 2 of each server node. Up to 6DDR3 DIMM slots dedicated per socket.

NOTE: For additional information, please see the HP Memory QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/14225_div/14225_div.html

NOTE: RDIMMs and ULVDIMMs are all distinct memory technologies and cannot be mixed within a server. The majority of AMD based servers support RDIMM and ULVDIMM.

NOTE: Depending on the memory configuration and processor model, the memory speed may run at 1600MHz or 1333MHz. Please see the Online Memory Configuration Tool at: www.hp.com/go/ddr3memory-configurator.

Registered DIMMs (RDIMM)

HP 4GB (1x4GB) Single Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647871-B21
HP 8GB (1x8GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647877-B21
HP 16GB (1x16GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647883-B21

Ultra Low Voltage DIMM (ULVDIMM)

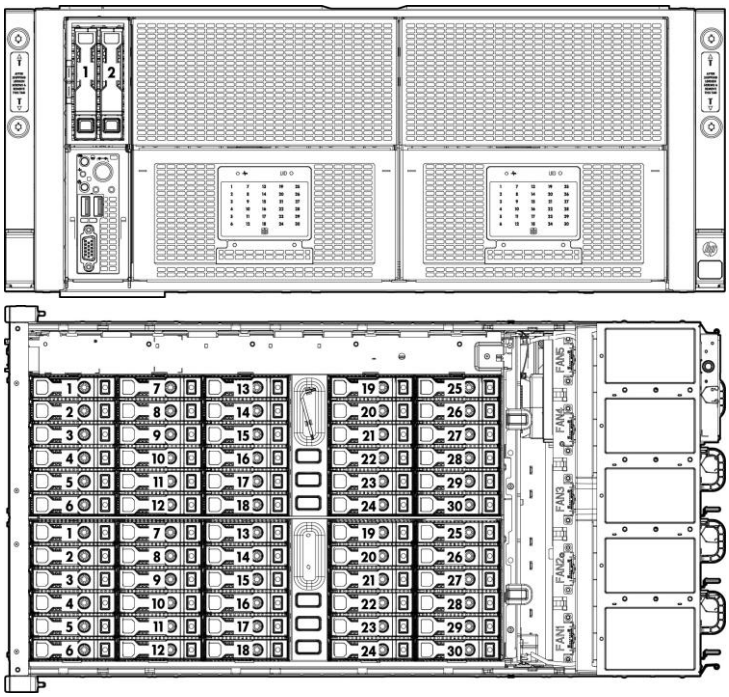
HP 4GB (1x4GB) Single Rank x4 PC3U-10600R (DDR3-1333) Registered CAS-9 Ultra Low Voltage Memory Kit	647869-B21
HP 8GB (1x8GB) Dual Rank x4 PC3U-10600R (DDR3-1333) Registered CAS-9 Ultra	647875-B21

Memory

	Low Voltage Memory Kit	
	HP 16GB (1x16GB) Dual Rank x4 PC3U-10600R (DDR3-1333) Registered CAS-9 Ultra Low Voltage Memory Kit	647881-B21

Storage

1x60 Model

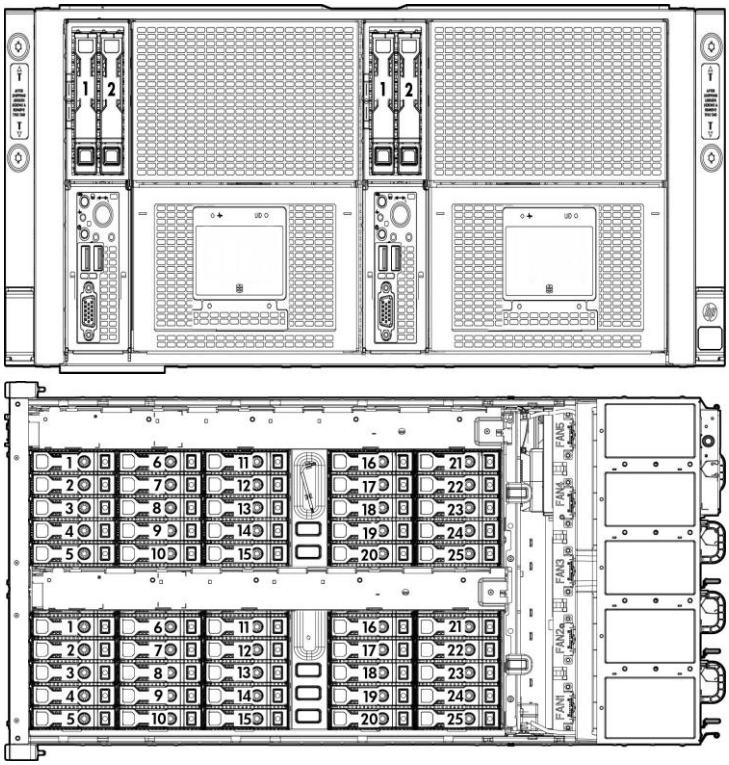


1-2 2 x SFF SATA/SATA SDD Hot Plug Hard Drive Bays

1-30 30 x LFF SATA/SAS/SDD Hot Plug Hard Drive Bays Controller Port 1i

1-30 30 x LFF SATA/SAS/SDD Hot Plug Hard Drive Bays Controller Port 2i

2x25 Model



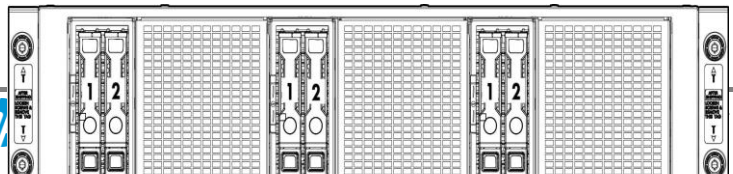
1-2 2 x SFF SATA/SATA SDD Hot Plug SFF Hard Drive Bays for server node 1

1-2 2 x SFF SATA/SATA SDD Hot Plug SFF Hard Drive Bays for server node 2

1-25 25 x LFF SATA/SAS/SDD Hot Plug Hard Drive Bays for server node 1

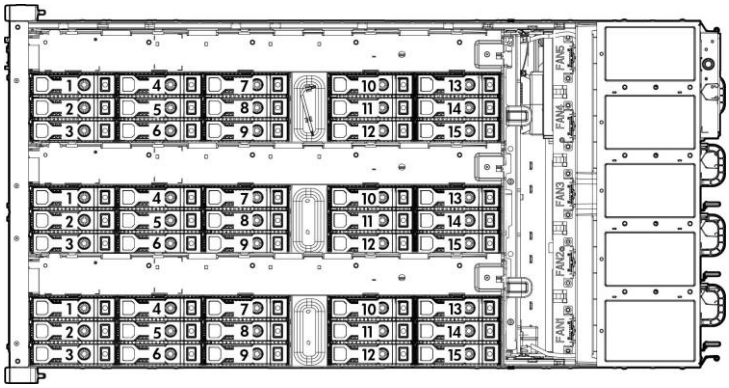
1-25 25 x LFF SATA/SAS/SDD Hot Plug Hard Drive Bays for server node 2

3x15 Model



1-2 2 x SFF SATA/SATA SDD Hot Plug SFF Hard Drive Bays for server node 1

Storage



1-2 2 x SFF SATA/SATA SDD Hot Plug SFF Hard Drive Bays for server node 2

1-2 2 x SFF SATA/SATA SDD Hot Plug SFF Hard Drive Bays for server node 3

1-15 15 x LFF SATA/SAS/SDD Hot Plug Hard Drive Bays for server node 1

1-15 15 x LFF SATA/SAS/SDD Hot Plug Hard Drive Bays for server node 2

1-15 15 x LFF SATA/SAS/SDD Hot Plug Hard Drive Bays for server node 3

Maximum Storage Capacity - 1x60 Model

Internal (2 SFF Drive Cage)	2TB (2 x 1TB SATA SFF)
Internal (60 LFF Drive Cage)	240TB (60 x 4TB SATA LFF)
Total	242TB

Maximum Storage Capacity - 2x25 Model

Internal (2 SFF Drive Cage)	4TB (4 x 1TB SATA SFF)
Internal (60 LFF Drive Cage)	200TB (50 x 4TB SATA LFF)
Total	204TB

Maximum Storage Capacity - 3x15 Model

Internal (2 SFF Drive Cage)	6TB (6 x 1TB SATA SFF)
Internal (50 LFF Drive Cage)	180TB (45 x 4TB SATA LFF)
Total	186TB

Technical Specifications

System Unit	**Chassis Dimensions** (H x W x D)	7.47 x 17.45 x 35.34in (18.96 x 44.33 x 89.97cm) **NOTE:** Rack chosen is required to have 1200mm to provide space for cable management arm at the rear of the chassis and host PDU in the rear of the rack	
	Weight (approximate)	Maximum (all hard drives, power supply, and processor installed)	220lb (99.8kg)
	Input Requirements (per power supply)	Rated Line Voltage	100 to 120 VAC 200 to 240 VAC
		Rated Input Current	For 1200 W Power Supply: 10 A (at 100 VAC), 4.9 A (at 200 VAC) For 750 W Power Supply: 8.9 A (at 100 VAC), 4.3 A (at 200 VAC)
		Rated Input Frequency	50 to 60 Hz
		Rated Input Power	For 1200 W Power Supply: 930 W (at 100 VAC), 1348 W (at 200 VAC) For 750 W Power Supply: 857 W (at 100 VAC), 824 W (at 200 VAC)
	Power Supply Output (per power supply)	Rated Steady-State Power	For 1200 W Power Supply: 800 W (at 100 VAC), 900 W (at 120 VAC), 1200 W (at 200 to 240 VAC)
		Maximum Peak Power	For 1200 W Power Supply: 800 W (at 100 VAC), 900 W (at 120 VAC), 1200 W (at 200 to 240 VAC) For 750 W Power Supply: 750 W (at 100 to 120 VAC), 750 W (at 200 to 240 VAC)
	Power Specifications	To review typical system power ratings use the HP Power Advisor which is available via the online tool located at URL: www.hp.com/go/proliant-energy-efficient or www.hp.com/go/hppoweradvisor.	
	Power Supply Output (per power supply)	Rated Steady-State Power	
	System Inlet Temperature	Operating	50° to 95° F (10° to 35° C) at sea level with an altitude derating of 1.8°F per every 1000 ft (1.0°C per every 304.8 m) above sea level to a maximum of 10,000 ft (3048 m), no direct sustained sunlight. Maximum rate of change is 18°F/hr (10°C/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 86°F (30°C).
		Non-operating	-22° to 140° F (-30° to 60° C) Maximum rate of change is 36°F/hr (20°C/hr).
	Relative Humidity (non-condensing)	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
		Non-operating	5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum

Technical Specifications

		wet bulb temperature, non-condensing.
Altitude	Operating	10,000 ft (3048 m). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 1500 ft/min (457 m/min).
	Non-operating	30,000 ft (9144 m). Maximum allowable altitude change rate is 1500 ft/min (457 m/min).
Acoustic Noise	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).	
	Idle	
	L WAd	7.13 B
	L pAm	57.39dBA
	Operating	
	L WAd	7.13 B
	L pAm	57.43dBA
Emissions Classification (EMC)	**FCC Rating**	Class A
	Normative Standards	CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1

NOTE: Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.

HP Ethernet 1Gb 2-port 362i	**Network Interface**	10Base-T/100Base-TX/1000Base-TX	
	Compatibility	IEEE 802.3 10Base-T IEEE 802.3ab 1000Base-T IEEE 802.3u 100Base-TX IEEE 1588, IEEE 802.1AS IEEE 802.3az - Energy Efficient Ethernet (EEE)	
	Data Transfer Method	PCI Express v 2.1, 5.0 GT/s and 2.5 GT/s bus speeds and supports for x1, x2, x4 links widths (Lanes)	
	Controller	I350 Powerville	
	Network Transfer Rate	10Base-T (Half-Duplex)	10 Mb/s per port, 20 Mb/s Combined
		10Base-T (Full-Duplex)	20 Mb/s per port, 40 Mb/S Combined
		100Base-TX (Half-Duplex)	100 Mb/s per port, 200 Mb/s Combined
		100Base-TX (Full-Duplex)	200 Mb/s per port, 400 Mb/s Combined
		1000Base-TX (Half and Full-Duplex)	1000Mb/s per port, 2000 Mb/s Combined
	Connector	RJ-45	
	Cable Support	10Base-T	Categories 3, 4 or 5 UTP; up to 328 ft (100 m)
		10/100/1000Base-TX	Category 5 UTP; up to 328 ft (100 m)

HP Ethernet 10Gb 2P 544i Adapter	**Data Transfer Method**	Compliant to x8 PCIe Gen2 Specification
	Network Transfer Rate	X4 IB: 10 Gb/s (SDR), 20 Gb/s (DDR), 40Gb/s (QDR) 10Gb/s Ethernet: Full-duplex single lane XFI

Technical Specifications

	Connector	QSFP - IB SFP+ - 10Gb/s Ethernet	
	Cable Support	IB: 10Gb/s **NOTE:** IB supported with addition of HP IB Enablement Kit	HP copper and optical IB cables HP copper and optical SFP+ cables
HP Smart Array P420i Controller	**Dimensions**	Embedded	
	Disk Drive and Enclosure Interface - Transfer rate	6Gb/s SAS (Serial Attached SCSI) 6Gb/s SATA (Serial ATA)	
	SAS Connectors	2 internal 4X connectors	
	Cache Memory Speed	1GB or 2GB FBWC DDR3-1333MHz with 72-bit wide bus	
	Server Interface	x8 PCIe 3.0 operating at PCI 2.0	
	SAS Speed	(8) 6Gb/s SAS links provide 4.8GB/s maximum bandwidth	
	Cache Memory	72-bit 1GB FBWC or 72-bit 2GB FBWC	
	Logical Drives Supported	Up to 64 logical drives with cache	
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space	
	RAID Support	RAID 6, 60 (Advanced Data Guarding) RAID 5, 50 (Distributed Data Guarding) **NOTE:** A minimum of 512 MB cache is required to enable RAID 5, 50, 6, 60 **NOTE:** HP Smart Array Advanced Pack (SAAP 2.0) is no longer required to enable RAID 6 & 60 (Advanced Data Guarding). However, controller must be in firmware version 4.68 (or later). RAID 1+0 (Striping & Mirroring) RAID 0 (Striping), RAID 1 (Mirroring)	
Environment-friendly Products and Approach	**End-of-life Management and Recycling**	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.	

Summary of Changes

Date	Version History	Action	Description of Change:
01-Nov-2014	From Version 10 to 11	Changed	Service and Support section updated
09-Jun-2014	From Version 9 to 10	Changed	Hard Drives, Networking, Insight Control, Tape Backup, and Basic and Remote Monitoring Power Distribution Units were revised.
13-Dec-2013	From Version 8 to 9	Changed	Step 1A was removed from Configuration Information 3G SATA MLC Hot Plug LFF & SFF Enterprise Mainstream Solid State Drives were removed from Hard Drives HP Power Distribution Units were removed from Additional Options HP Tape and Disk Storage Systems were added to Additional Options HP Basic Power Distribution Units, HP Remote Monitoring Power Distribution Unites, and HP Intelligent Power Distribution Unites were revised in Additional Options
15-Nov-2013	From Version 7 to 8	Changed	Minor change made to the Hard Drives section only.
11-Oct-2013	From Version 6 to 7	Added	HP 300GB and 600GB 6G SATA Value Endurance LFF 3.5-in Enterprise Boot Solid State Drives to were added Hard Drives Mainstream Endurance PCIe Workload Accelerators were added to HP PCIe Workload Accelerator Options HP Remote Monitoring Power Distribution Units was added to Additional Options
10-Sep-2013	From Version 5 to 6	Changed	HP Insight Management, Memory, HP Storage Controllers, HP Power Distribution Units, and HP Care Pack Services were revised HP HPC Linux Value Pack was removed from High Performance Clusters 6G SATA Value Endurance Hot Plug LFF Enterprise Value Solid State Drives were added to Hard Drives HP Ethernet 10Gb 2P 561T Adapter was added to Networking
13-May-2013	From Version 4 to 5	Changed	Standard Features- Maximum Internal Storage Additional Options- HP Basic Power Distribution Units
08-Apr-2013	From Version 3 to 4	Removed	Technical Specifications: Removed Integrated Lights-Out 3(iLO3) integrated on system board
		Changed	Standard Features: Network Controller, Storage Controllers, Internal Storage Devices, Maximum Internal Storage, Interfaces and Form Factor sections. Optional Features: Updated HP Insight management

Summary of Changes

			section. Configuration Information: Updated Notes at beginning of section, Step 1, Step 1A, Step 2 and Step 3. Core Options: Updated HP Processors, HP Memory, HP Hard Drives, HP Networking and HP InfiniBand sections. Additional Options: HP Insight Software and HP Tape Backup sections. Memory: HP Memory section. Technical Specifications: Updated Weight in the the System Unit
		Added	Added SL4545 G7 3x15 model information throughout entire QS. Technical Specifications: HP Ethernet 10Gb 2P 544i Adapter section.
01-Mar-2013	From Version 2 to 3	Removed	Additional Options: Removed T9074BAE, 452148-B22 and 436222-B21 from the HP Insight Software section.
04-Dec-2012	From Version 1 to 2	Changed	Changes made to the following sections: Overview Standard Features: On System Management Configuration Information: Step 1, Step 2, Step 3 Core Options: Hard Drives Additional Options: Added HP Care Pack Services Storage

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Summary of Changes

For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less.